

Improving the Effectiveness of Stormwater Management in Maine



A Report to the 121st Maine Legislature

Submitted by

**The Maine Department of Environmental
Protection**

February 1, 2004

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CONTENTS

Executive Summary	3
Introduction	5
Stakeholder Process	6
Stormwater Management Issues	7
Guiding Principles for Management Strategy	9
Recommendations	9
Appendix 1: Stakeholder Participants	15
Appendix 2: Rationale for Using Imperviousness for Most at Risk Designation.....	<i>To be added</i>
Appendix 3 List of Proposed “Most at Risk” Streams ...	18
Appendix 4. Candidate “Sensitive or Threatened” Locations.....	21
Appendix 5. Draft Statutory Changes.....	24
Appendix 6. Options for Managing Stormwater.....	26

Executive Summary

In 2003, the Maine Department of Environmental Protection (Department) introduced a bill to the Maine Legislature, which led to a mandate that the Department report back to the Legislature by February 1, 2004 with recommendations for improving stormwater management in Maine. The mandate required the Department to consult with state and federal agencies and representatives of interested stakeholder groups. The Joint Standing Committee on Natural Resources is authorized to report out legislation based on the recommendations related to storm water management to the Second Regular Session of the 121st Legislature.

A stakeholder group was convened in May 2003, and met monthly thereafter through January 2004. A number of issues were discussed at the meetings. To help guide the development of recommendations, the following guiding principles were agreed to:

1. Stormwater standards should result in meaningful protection. They should accomplish protection without unnecessary requirements; they should be achievable, cost-effective and based on good science.
2. Stormwater standards should not foster an unintended consequence of sprawl, as defined by state policy.
3. Stormwater standards should be understandable. They should be comprehensible and written in plain English. They should not be unnecessarily complex.
4. Stormwater standards should not conflict with other major environmental initiatives.

The Department has developed recommendations for statutory changes to:

- Require that basic water quality protection standards be met by all projects;
- Set the permit threshold at one acre of disturbance;
- Allow “license by rule” for infiltration of stormwater; and
- Regulate existing sources in the watersheds of impaired waters where they are identified as significant contributors;

The Department is also recommending that it proceed with rule changes to:

- Define and designate “most at risk” watersheds and “sensitive or threatened” regions or watersheds as directed in the Maine Stormwater Law;
- Revise the Quantity and Quality standards in the Stormwater Rules to provide more meaningful protection, and to provide applicants with options where on-site treatment of stormwater is not feasible, such as compensation fees or off-site mitigation;
- Allow for reduced standards for development proposed in an impaired watershed that is also in a municipally designated growth zone if a Local Watershed Management Plan has been developed to address the causes of impairment;

- Develop maintenance requirements that will improve the level of maintenance on the stormwater treatment practices located on their property by requiring periodic inspection and certification of those practices by an engineer or other qualified person;
- Resolve problems that have come to light through administering the program since 1997; and
- Allow for the use of innovative approaches to meeting stormwater standards, provided contingency plans are developed for use in the event the innovative approach does not work.

The Department recommends that if, through the TMDL process, it should identify impaired urban streams where the Department determines that it would be infeasible to restore water quality to meet designated uses, then the Department should conduct a Use Attainability Analysis (UAA) for the water resource.

The Department also recommends that it take the following non-regulatory actions:

- Provide municipalities with tools for developing local stormwater management programs (the Maine Stormwater Law already provides for delegation of the program to a municipality if an approved local program exists).
- Develop a list of financial assistance options for municipalities or watershed districts seeking to develop and/or implement local management programs. The Department should include consideration of these needs in developing priorities for environmental bonds.
- Develop information for the regulated community to improve their understanding of what they need to do to comply with state and federal program requirements. This information should also describe ways to minimize stormwater impacts through the use of Low Impact Development measures.
- Continue the education campaign to build the public's knowledge base on stormwater issues.
- Continue to offer training to a variety of audiences (developers, contractors, consultants, and municipal officials) on proper erosion and sedimentation controls.

A. Introduction

Stormwater management has become a topic of increasing concern in Maine, both environmentally and politically. As progress has been made in cleaning up our State's waters from end-of-pipe wastewater discharges, we're now finding that some of our most significant water quality problems are not from these discharges, but from the cumulative effect of a number of activities ranging from agriculture to development to household management. Pollutants from these activities include toxins, bacteria, sediment and nutrients, and they are often conveyed to our water resources via stormwater runoff.

The Maine Department of Environmental Protection (Department) has been working on stormwater management issues for many years through several programs. The Department's Nonpoint Source Program has invested significant resources in identifying and eliminating sources. Controlling erosion and sedimentation from land use activities has been a focus of the Site Location Law since the early 1970's. However, the focus on stormwater developed more recently. In 1996, the Maine Stormwater Management Law was passed, and, in 2003, new federal requirements went into effect under the National Pollutant Discharge Elimination System (NPDES) stormwater program.

The Department's experience administering the Stormwater Law, coupled with the added responsibility of administering the federal program requirements, led Department staff to conclude that we need to re-think how stormwater management should be conducted. The Department introduced a bill to the Legislature in 2003, which led to the following mandate:

Sec. 5. Report. By February 1, 2004, the Department of Environmental Protection shall report to the Joint Standing Committee on Natural Resources with recommendations for improving the effectiveness of storm water management in this State. These recommendations may include draft rules pursuant to the Maine Revised Statutes, Title 38, sections 413 and 420-D to regulate storm water discharges to impaired waters from existing development where necessary to allow restoration of water quality and from new development both during and after construction. The department may also make recommendations concerning other issues such as encouraging the creation of local or regional storm water utility districts and funding storm water management programs at the state and local level, including long-term efforts to inspect, maintain and upgrade or retrofit storm water management systems in impaired or at-risk watersheds or sensitive or threatened regions or watersheds.

The department shall consult with state and federal agencies as well as representatives of interested stakeholder groups, including business and environmental groups and the Maine Municipal Association, when developing these recommendations. The Joint Standing Committee on Natural Resources may report out legislation

based on the recommendations related to storm water management to the Second Regular Session of the 121st Legislature.

As part of the Stormwater Rules adopted by the Board of Environmental Protection and approved by the Maine Legislature in 1997, the Department has been tasked with developing a list of “most at risk” rivers and streams. This task remained uncompleted up until 2002 because of a lack of sufficient data, and since 2002, because of the desire of many interested parties to have the Department’s proposal reviewed through a stakeholder process. The stakeholder process began in the summer of 2002 to help the Department develop language for a general permit for discharges from construction activities, in accordance with Federal stormwater requirements from the National Pollutant Discharge Elimination System (NPDES) Program. The stakeholder group completed that work in December 2002, and then was reconvened in May 2003 to provide input to the Department for this report.

B. Stakeholder Process

In 2002, the Department convened two separate stakeholder groups on stormwater management. The groups were convened to provide guidance on how we should implement new federal stormwater requirements from the National Pollutant Discharge Elimination System (NPDES) Program. The NPDES Program includes requirements that 28 municipalities, located in four urban areas of the state (southern border, greater Portland, Lewiston and Bangor) develop and implement stormwater management programs. One stakeholder group provided input on how the state should administer this program with the affected municipalities. The NPDES Program also requires that the Department regulate all construction activities that create at least one acre of disturbed land and result in a point source stormwater discharge from the site.

A second stakeholder group was convened to provide input on how this requirement should be administered, including input on the feasibility of integrating this part of the NPDES Program with the Maine Stormwater Law requirements. Because of a March 2003 deadline for implementing the federal NPDES requirements and the number of issues that the Department raised concerning the state program, the group and the Department concurred that developing an integrated program was not feasible within that timeframe. However, the stakeholders and Department also agreed that discussions should continue on how to address stormwater issues.

The second stakeholder group was reconvened in May 2003 and has met monthly since that time to assist in developing this report. Participants have included representatives from the groups identified in the Legislative mandate above. A professional facilitator was hired to run the meetings. A list of participants appears in Appendix 1. A significant amount of time in meetings was

spent providing information on how water quality is managed in Maine. Presentations were given on how water quality in streams is assessed, how waters are classified, and the relationship between stream water quality and the amount of development in a watershed.

C. Stormwater Management Issues

The following issues have been identified that need to be addressed:

1. Streams have not yet been added to the “most at risk” or “sensitive or threatened” lists under the Stormwater Law. Department staff has proposed that the percentage of impervious area in a watershed of a stream provide the basis for listing a stream as “most at risk” (see Appendix 2) In addition, those streams determined to be impaired due to urban runoff would also be included on the list (in most cases, impaired waters will also exceed the impervious threshold for “most at risk” designation; see Appendix 3). Standards have been proposed (to be included in draft rule). There is disagreement among some stakeholders as to whether it is appropriate to use a single threshold of imperviousness for designating “most at risk” streams, and as to what that level should be.
2. The Classification of Maine Waters law, Title 38 MRSA Section 464 (4)(F)(3) provides that “[t]he department may issue a discharge license ... for a project affecting a water body in which the standards of classification are not met if the project does not cause or contribute to the failure of the water body to meet the standards of classification.” To meet this requirement, applicants proposing to discharge stormwater to waters impaired due to urban development will need to take measures to show that there is no net contribution to the impairment. Cost and technical feasibility have been raised as concerns for meeting this requirement.
3. Imposing stricter standards on “most at risk” or “sensitive or threatened” watersheds, which in most cases will be located in urban areas, will increase development costs in these areas. This has led to a concern that the rules would create an incentive for a developer to relocate to an outlying area, thereby contributing to more sprawl.

Even if strict standards are imposed on new development in watersheds of impaired waters, water quality will not meet standards, unless discharges from existing development are reduced. Under the authority of the federal Clean Water Act, DEP is assessing causes of impairment through development of Total Maximum Daily Loads (TMDL) for impaired waters, including those impaired due to nonpoint sources typically entering the resource through stormwater runoff. The process for identifying these sources is a time-consuming one that will take department staff many years to

complete, making it difficult to know, in the short term, who should be included as an existing source for the purposes of regulation.

4. A. Current quantity and quality standards in DEP's rules have not been viewed as effective by DEP staff, nor by consulting engineers. The engineering community is still learning about the efficiencies and effectiveness of Best Management Practices. The existing "peak flow" standard for controlling the quantity of runoff leaving a development is seen as insufficient in that it does not protect a water resource from damage due to an increase in the total volume of runoff leaving a site. In addition, the heavy reliance on percentage removal of total suspended solids (TSS) for protecting water quality is seen as insufficient in that the resulting discharge of sediment will be highly variable depending on the grain size distribution of the sediment load being treated. While it is easier to treat a sediment load that has a high percentage of coarse sand, it is the fine particles, silts and clays that will not be removed, but are the greatest concern for impacting water quality.

B. The use of infiltration practices to treat stormwater has also raised concerns about potential ground water impacts. Infiltration of stormwater from some sources may need pre-treatment, or may not be appropriate for infiltration. Other sources that are relatively clean, such as rooftop runoff, are more appropriate for infiltration. However, in many locations in Maine, soils are not suitable to allow a significant level of infiltration to occur. In these locations, certain Best Management Practices may allow for some incidental infiltration to occur, while the remaining stormwater will be discharged to surface water. There is need for clarification in the standards for what is considered infiltration, and for the conditions under which infiltration may be appropriate.

C. The requirements for projects in most at risk watersheds, and in particular, impaired watersheds can be expensive and technically difficult to meet. Options are needed for projects in these watersheds, such as paying a compensation fee or providing for mitigation work off the project site.

5. Maintenance of stormwater Best Management Practices has been poor to date, according to Department staff, municipal officials and members of the engineering consultant community. The Department and municipalities lack sufficient resources to conduct compliance inspections and follow-up with permittees to ensure that maintenance is carried out. Without the needed maintenance, BMPs often become ineffective and in some instances, may do more harm than good.
6. Currently, stormwater is largely managed on a site by site basis, through the permit review process. This approach does not, in most cases, allow for a holistic, watershed perspective for water resource protection. For example, the detention of runoff from a development may be appropriate when looked

at individually, but when combined with many other developments in the watershed, may result in a greater impact on a stream by lengthening the period of erosive high flows in the stream. In addition, many small developments are below the regulatory threshold and are therefore unregulated. The cumulative impact of these developments is often significant.

7. The existing Stormwater Law and Rules is seen by many, including DEP Licensing staff, as very complicated and difficult to understand.
8. The overlap with the Maine Construction General Permit, adopted pursuant to the federal NPDES Stormwater regulations has added to the complexity of stormwater regulation in Maine. The two programs have different thresholds and standards. It would be much easier for applicants and administrators alike, if these programs could operate with similar thresholds and standards, such that a single application form could be used to meet the requirements of both programs.

D. Guiding Principles for Management Strategy

The stakeholder group discussed what the underlying principles should be that guide decisions on stormwater management in Maine. Broad agreement was reached that the following four principles should provide guidance, recognizing that there will be tension between these principles and that trade-offs will be inevitable:

1. Stormwater standards should result in meaningful protection. They should accomplish protection without unnecessary requirements; they should be achievable, cost-effective and based on good science.
2. Stormwater standards should not foster an unintended consequence of sprawl, as defined by state policy.
3. Stormwater standards should be understandable. They should be comprehensible and written in plain English. They should not be unnecessarily complex.
4. Stormwater standards should not conflict with other major environmental initiatives.

E. Recommendations

1. The Maine Stormwater Law should be amended so that a basic level of water quality protection standards applies to all regulated area of the state, focusing on erosion and sedimentation control, housekeeping and maintenance of "best management practices" (see Appendix 5). The Maine Erosion and

Sedimentation Control Law (ESC Law) alone is not providing sufficient protection.

Rationale: Under the Maine Stormwater Management Law, quality standards only apply if a project is located in a “most at risk” or “sensitive or threatened” watershed. This means that we don’t have the ability to require basic measures to protect water quality. Since we want to keep our waters clean, all projects should be meeting basic standards for erosion and sedimentation control and housekeeping, and should be required to maintain any BMPs used. These are low cost measures that if taken, will help avoid the need for much higher cost remedial measures at some point in the future.

2. The Maine Stormwater Law should be amended so that a one-acre disturbance is subject to regulation rather than using the multi-tiered approach in current law (20,000 sq. ft. impervious, 1 acre impervious or 5 acres disturbed depending on designation of watershed). (See Appendix 5.)

Rationale: A single threshold is easier to administer, more readily understandable by the public, and more consistent with the one-acre disturbance threshold in the Federal NPDES Program. It would simplify the question of when a permit is needed and would allow for integration of the state and federal programs. The proposed 1-acre disturbed threshold for the Stormwater Law differs from the federal threshold in that:

- It applies regardless of location (there is no “discharge” limitation). The approach proposed is consistent with Maine’s approach to area thresholds in Maine’s ESC Law, Stormwater Law and Site Law, and reflects the State’s watershed approach to protection of water quality. Basic standards need to be met everywhere in the watershed, and temporary measures need to be in place before the beginning of construction.
- The proposed one-acre threshold does not allow the Department to, at its discretion, review projects below one acre in size. This case-by-case smaller threshold is part of federal law and the Maine Construction General Permit (MCGP), but the Department does not propose to add it into the Maine Stormwater Management Law.

The Department is proposing that projects between 1 and 5 acres disturbed, but less than 20,000 square feet of impervious area in “most at risk” watersheds, or less than 1 acre impervious area in other watersheds be eligible for a “permit by rule.” Permit by rule standards would be basic standards similar to those now in the MCGP, and the MCGP notification would be combined with the permit by rule in those cases where both applied. Other changes in procedures and fees intended to consolidate and simplify these programs are also being considered.

3. The Protection and Improvement of Waters Law should be amended to allow “license by rule” standards for infiltration of stormwater (this proposed amendment is in the Department’s omnibus proposal for this session).

Rationale: This change will eliminate the need for a person who proposes to use infiltration of stormwater, and who is following standards, from having to get a separate wastewater discharge license. Such a requirement would be an unnecessary burden for both applicants and for Department staff administering the program.

4. The Department should use the existing Total Maximum Daily Load (TMDL) assessment process, or an equivalent assessment process to identify significant existing sources of pollutants in impaired watersheds. The Department should seek authority under the Stormwater Law to regulate those sources (See Appendix 5).

Rationale: The Department is required by Federal law to conduct water quality assessments of its surface waters and to develop TMDLs for waters that do not attain their water quality classification. These TMDLs should provide information on the pollutant sources that are causing non-attainment. If water quality is to be restored, those sources need to be reduced or eliminated.

5. The Department, through rule, should continue the process of defining and designating “most at risk” watersheds and “sensitive or threatened” regions or watersheds as directed in the Maine Stormwater Law. Streams that are impaired due to urban runoff should be included in the category of “most at risk” as well as streams that have at least 7% of their watershed in impervious area (see Appendix 3). Areas that are expected to receive sufficient economic or population growth over the next 25 years to have an impact on water quality should be included as “sensitive or threatened.”

Rationale: One of the guiding principles embraced by the stormwater stakeholder group is that the standards should provide “meaningful protection,” i.e., they should accomplish protection without unnecessary requirements. The “most at risk” and “sensitive or threatened” categories provide a way to tailor the standards to the needs of a particular watershed or region.

Discharges from development in impaired watersheds may be allowed where they will not cause or contribute to a violation of water quality standards. To meet this requirement where urban runoff is a significant contributor to the impairment means that rigorous standards will need to be met. Thus, it is appropriate that impaired streams be included as “most at risk” which allows the Department to require a higher standard. Watersheds that are at least 7% impervious are appropriate for “most at risk” designation given data

showing that streams begin to show measurable degradation when approximately 10% of the watershed is impervious.

In addition to watersheds where development activity is already putting water quality at risk, there will be other areas where foreseeable future development will also threaten water quality. The Department expects these to be places where a significant amount of commercial development will likely occur. No widely accepted models have been identified for projecting development activity. One way of identifying these areas is to project future populations and population densities. The Department is still working on how to best identify these areas and is seeking input on a proposal to use a linear projection of population growth between 1990 and 2000 to project populations and densities in the year 2030. Using this approach, a list of municipalities with a projected population in 2030 of at least 5,000 or a projected density of at least 150 people per square mile has been identified. These would be places where commercial development would be expected, making these candidates for "sensitive or threatened" designation (see Appendix 4).

6. The Department, through rule, should develop quantity and quality standards that provide better protection than the current peak flow and Total Suspended Solids standards provide. The standards should also provide options such as compensation fees in most at risk watersheds, including impaired watersheds, where a Local Compensation Fee Utilization Plan exists and off-site mitigation credits for applicants with projects proposed to be located in impaired watersheds (where they are not allowed to cause or contribute to a water quality violation).

Rationale: This recommendation is again based on the guiding principle that the standards should provide meaningful protection. It is also based on the recognition that for larger projects in impaired watersheds, there needs to be some flexibility if any such projects are to be allowed.

7. The Department, through rule, should allow for reduced standards in impaired watersheds where a Local Watershed Management Plan has been developed to address the causes of impairment, provided the plan is approved by the Department, and is being implemented. The amount of reduction in standards for new development would be case specific and would need to ensure that the goals of water quality restoration would be achieved through treatment of existing sources of pollution. The Department should allow implementation to be deferred in municipal designated growth zones until financial assistance is available, or up to five years, whichever comes first .

Rationale: Local management plans can be better tailored to address issues in a watershed than the state-run stormwater program. In the long run, and with State oversight, they will probably result in more successful protection or restoration work. The Department wants to provide incentive for

municipalities to develop local management plans, including where appropriate, stormwater utility districts. Linking implementation of plans to the availability of financial assistance in designated growth zones would provide a way of encouraging growth in these areas without sacrificing progress over the long term in meeting water quality goals.

8. The Department, through rule, should develop maintenance requirements that will improve the level of maintenance on the stormwater treatment practices located on their property by requiring periodic inspection and certification of those practices by an engineer or other qualified person.

Rationale: According to Department field services staff, municipal officials and consulting engineers, maintenance of stormwater BMPs to date has been very poor in general. These groups also agree that the effectiveness of BMPs is greatly diminished without maintenance, in some cases to the point that they do more harm than good. For permitted sites, periodic inspection and certification requirements would increase the likelihood that the needed maintenance will occur, and help the Department to make more effective use of its limited resources for targeted inspections.

9. The Department should make additional amendments to the stormwater rules to resolve problems that have come to light through administering the program since 1997. Examples of such needed changes include standards for stormwater basins, standards for buffers, and revised permit by rule standards to focus on projects that do not require engineering review.

Rationale: The Department has been collecting a list of issues since it began administering the program in 1997. The Department will include amendments to address these issues at the same time as it proposes other rule changes proposed above.

10. The Department, through rule, should allow for the use of innovative approaches to meeting stormwater standards, provided contingency plans are developed for use in the event the innovative approach does not work.

Rationale: New products and techniques for stormwater management are still emerging. The Department should encourage innovation in the interest of gaining more information on what works in Maine. Where outcomes are uncertain, there should be back-up plans in place, however, to ensure that there will not be long-term water quality impacts in the event an innovative approach does not work.

11. If the Department should, through the TMDL process, identify impaired urban streams where the Department determines that it would be infeasible to restore water quality to meet designated uses, then the Department should conduct a Use Attainability Analysis (UAA) for the water resource.

Rationale: The Department's long-term goal for all waters is to have them meet their water quality classification. Over time, opportunities may develop to improve even severely impaired waters. The Use Attainability Analysis is a tool of "last resort" where all efforts to restore water quality that are practicable have been taken and the water still will not meet its classification. If there are urban streams that fit this description, then a UAA is an appropriate action.

Non-Regulatory

12. The Department, with assistance from the Maine State Planning Office, should provide municipalities with tools for developing local stormwater management programs (the Maine Stormwater Law already provides for delegation of the program to a municipality if an approved local program exists).

Rationale: Municipal officials are only just becoming aware of stormwater as an issue that needs to be dealt with at the local level. They need guidance and tools for managing this issue. The State needs to provide this information in order to promote local solutions.

13. The Department, with input from municipalities, should develop a list of financial assistance options for municipalities or watershed districts seeking to develop and/or implement local management programs. The Department should include consideration of these needs in developing priorities for environmental bonds.

Rationale: If municipalities are to play a larger role in managing stormwater, they will need financial assistance.

14. The Department should develop information for the regulated community to improve their understanding of what they need to do to comply with state and federal program requirements. This information should also describe ways to minimize stormwater impacts through the use of Low Impact Development measures.
15. The Department should continue its campaign to build the public's knowledge base on stormwater issues.
16. Continue to offer training to a variety of audiences (developers, contractors, consultants, municipal officials) on proper erosion and sedimentation controls.

Rationale (14 – 16): Awareness surveys have shown that stormwater is not well understood by the public, including the regulated community. In order to

improve the quality of stormwater management designs associated with new development, or with retrofitting existing development, information on how to reduce development impacts needs to be developed and actively promoted.

Appendix 1. Stakeholder Participants

Facilitator: Ann Gosline

<u>Name</u>	<u>Stakeholder/organization</u>
Archino Howe, Ann	STT Design Consultants
Austin, Jeff	Maine Municipal Association
Barden, Michael	MPPA
Beal, Carl	ACEC
Bennett, Nick	NRCM
Bobinsky, Mike	City of Portland
Bradstreet, Steve	Env. Eng. & Remediation
Bragg, Dave	Milone & Macbroom
Braley, David	DHS-DWP
Brancsom, John	Maine Turnpike Authority
Bridge, Jennie	EPA
Brogunier, Hope	BACORD
Burns, Jenn	Maine Audubon
Butts, John	Assoc.Const of ME
Castallo, Jodi	Maine NEMO
Davis, Ginger	MEREDA
DellaValle, Beth	SPO
Dube, Norm	Atlantic Salmon Comm.
Earley, Kathi	City of Portland
Edelstein, Jeff	Interlocal SW Working
Geoffroy, Kate	Pierce Atwood
Glidden, Dale	Augusta Sanitary Dist.
Hall, Chris	Maine Chamber
Henderson, Zach	Maine Rivers
Janeski, Todd	SPO coastal program
Johannesman, Susan	OPLA
Joyce, Kat	Verrill & Dana
Kamila, Dave	ASCE
McKee, Kevin	Vortechnics
Newkirk, Peter	MDOT
Newman, Sharon	MTA (Preti Flaherty)
Olson, Chris	MDOT
Payne, Elizabeth	Bacord
Rabasca, Kristie	Env. Eng. & Remediation
Rettenmaier, Liz	SPO
Ring, Jim	City of Bangor
Rioux, Mike	ST. Germain
Schalit, Naomi	Maine Rivers
Shelley, Peter	CLF
Simon, John	Balanced Eng.
Stevens, Jay	ACEC
Timpano, Steve	IFW

Stakeholder Name	Organization
Tolman, Andy	DHS, Drinking Water Program
VanBourg, Jon	Maine Water Utilities Association

DEP Staff

Breton, Mary
Dennis, Jeff
Gates, Judy
Hubert, Marianne
Ladd, David
McGlaulin, Art
Richardson, Hetty
Waddell, Dave
Wetherill, Don

**Appendix 2 Rationale for Using Imperviousness for Most at Risk
Designation**
To be added

Appendix 3 List of Proposed “Most at Risk” Streams (Including Impaired Streams)

Proposed "Most at Risk" Streams											
Municipality	Stream Name	Wtrshed % Imp	Land Area (sq mi)	Biomon- tored?	Class	Impaired	AqL Class	DO Viol?	Bact Viol?	Urban Effect	TMDL Schedule
Auburn	Bobbin Mill Brook	7.9	1.54	1998	B	x	C	?	?	y	2008
Auburn	Logan Brook	11.4	0.28	pre 1998	B	x	?	y	y	?	2008
Augusta	Kennedy Brook	19.4	1.21	pre 1998	B	x	?	?	y	y	2012
Augusta	Stone Brook	7.0	3.53	n	B		?	?	?	?	
Augusta	Trib to Bond Brook	16.4	1.74	2001	B		?ip	?	?	?	
Augusta	Whitney Brook	12.2	1.63	n	B	x	?	?	y	?	
Bangor	Arctic Brook (Valley Ave)	21.7	0.97	1997	B	x	NA	?	?	y	2004
Bangor	Penjajawoc Str (incl. Meadow Bk)	5.8	8.57	2001	B	x	NA	?	?	y	2004
Bangor	Shaw Brook	9.0	5.48	2001	B	x	?ip	?	?	y	2008
Bangor	Unnamed Str (Ohio St)	31.2	1.49	2001	B	x	NA	?	?	y	2004
Bangor	Unnamed Str (Pushaw)	11.7	0.71	1997	B	x	NA	?	?	y	2004
Bangor	Unnamed Str Bangor 1	20.2	0.53	n	B		?	?	?	?	
Bangor	Unnamed Str Bangor 2	22.8	4.57	n	B		?	?	?	?	
Brewer	Unnamed Str Brewer 1	24.7	0.96	n	B		?	?	?	?	
Brunswick	Mare Brook	9.2	5.38	2000	B	x	NA	?	?	y	
Brunswick	Unnamed Str Brunswick 2	13.1	1.07	n	B		?	?	?	?	
Brunswick	Unnamed Str Brunswick 3	28.0	0.45	n	B		?	?	?	?	
Brunswick	Unnamed Str Brunswick 4	19.6	1.20	n	B		?	?	?	?	
Brunswick	Unnamed Str Brunswick 5	16.7	0.28	n	B		?	?	?	?	
Brunswick	Unnamed Str Brunswick 6	22.0	0.27	n	B		?	?	?	?	
Brunswick	Unnamed Str Brunswick 7	12.8	0.60	n	B		?	?	?	?	
Bucksport	Silver Lake Outlet	12.8	0.39	1996	B	x	C	?	?	?	
Calais	Unnamed Str Calais	21.8	0.18	n	B		?	?	?	?	
Camden	Megunticook River	15.3	1.22	n	B	x	?	?	y	?	
Caribou	Caribou Stream (in Caribou only)			1999	B	x	NA	?	?	y	2012
Ellsworth	Unnamed Str Ellsworth Falls	7.9	0.11	n	B		?	?	?	?	
Falmouth	Norton Brook	8.8	0.78	n	B		?	?	?	?	
Falmouth	Scitterygussett Creek	8.4	0.86	n	B		?	?	?	?	
Freeport	Concord Gully Brook	10.4	1.03	2001	B		?ip	?	?	?	
Freeport	Frost Gully Brook	5.5	2.63	2000	A	x	A	y	y	y	
Gardiner	Unnamed Str Gardiner	7.1	1.55	n	B		?	?	?	?	
Gray	Libby Brook	8.8	1.72	1999	B	x	C	?	?	?	
Lewiston	Dill Brook	15.4	3.45	1998	B	x	C	?	?	y	2008
Lewiston	Goff Bk			pre 1998	B	x	?	?	y	y	2008
Lewiston	Gully Brook			pre 1998	B	x	?	?	y	y	2008
Lewiston	Jepson Brook	18.3	2.52	pre 1998	B	x	?	y	y	y	2008
Limerick	Brown Brook			2000	B	x	NA?	?	?	y	2008
Lincoln	Mattanawcook Stream	20.6	0.23	2000	C		C	?	?	?	
Lisbon	Unnamed Str Lisbon 1	14.6	0.93	1998	B	x	C	?	?	y	

Maine Department of Environmental Protection
DRAFT Revised January 14, 2004

Municipality	Stream Name	Wtrshed % Imp	Land Area (sq mi)	Biomon- tored?	Class	Impaired	AqL Class	DO Viol?	Bact Viol ?	Urban Effect	TMDL Schedule
Norway	Pennesseewassee L Outlet	6.2	0.84	n	B	x	?	y	y	?	
Ogunquit	Stevens Brook			2000	B	x	NA	?	?	y	2008
Portland	Capisic Brook	24.8	2.76	1999	C	x	NA	y	y	y	2008
Portland	Fall Brook	22.0	1.56	n	C	x	NA?	?	?	y	2012
Portland	Unnamed Str Portland 1	10.2	0.37	n	C		?	?	?	?	
Portland	Unnamed Str Portland 2	23.2	1.44	n	C		?	?	?	?	
Portland	Unnamed Str Portland 3	24.6	1.29	n	B		?	?	?	?	
Portland	Unnamed Str Portland 4	24.8	0.45	n	B		?	?	?	?	
Portland	Unnamed Str Portland 5	27.6	0.23	n	C		?	?	?	?	
Portland	Unnamed Str Portland 6	16.8	1.20	n	C/B		?	?	?	?	
Presque Isle	Kennedy Brook	7.4	2.80	n	B		?	?	?	?	
Presque Isle	Unnamed Str	17.2	2.01	n	B		?	?	?	?	
Rockland	Lindsay Brook	18.7	1.17	n	B		?	?	?	?	
Rockland	Weskeag River Trib	13.1	0.53	n	B		?	?	?	?	
Saco	Goosefare Brook	7.1	9.42	2000	B	x	C	?	?	y	drafted
Scarborough	Phillips Brook			pre 1998	C	x		y	?	y	2008
Skowhegan	Water Supply Br	20.6	0.55	n	B		?	?	?	?	
Skowhegan	Whitten Brook	14.8	0.48	n	B	x	?	?	y	y	
So. Portland	Barberry Creek	23.9	1.39	1999	C	x	NA	y	y	y	2012
So. Portland	Long Creek	16.3	3.45	1999	C	x	CorNA	y	y	y	2004
So. Portland	Red Brook			1999	C	x	NA	?	?	?	2012
So. Portland	Spurwink River	14.8	1.66	n	C		?	?	?	?	
So. Portland	Trout Brook (incl. Kimball Bk)	15.4	2.66	2000	C	x	NA	?	?	y	2012
So. Portland	Unnamed Str S Portland 1	28.3	0.51	n	C		?	?	?	?	
Topsham	Unnamed Str Topsham 1	10.7	0.93	n	B		?	?	?	?	
Topsham	Unnamed Str Topsham 2	15.8	0.30	n	B		?	?	?	?	
Topsham	Unnamed Str Topsham 4	11.0	0.61	n	B		?	?	?	?	
Waterville	Unnamed Str Waterville 1	13.2	0.81	n	B		?	?	?	?	
Westbrook	Beaver Pond Brook	11.1	0.54	n	B		?	?	?	?	
Westbrook	Unnamed Str Westbrook 1	10.3	0.58	n	B		?	?	?	?	
Westbrook	Unnamed Str Westbrook 2	13.7	0.17	n	B		?	?	?	?	
Westbrook	Unnamed Str Westbrook 3	14.1	0.35	n	B		?	?	?	?	
Westbrook	Unnamed Str Westbrook 4	9.4	0.22	n	B		?	?	?	?	
Winslow	Unnamed Str Winslow 1	12.0	0.27	n	B		?	?	?	?	
Winterport	Unnamed Str Winterport 1	7.3	0.61	n	B		?	?	?	?	
Winthrop	Mill Stream			pre 1998	B	x	NA	?	?	?	2012

Key to
Headings

Maine Department of Environmental Protection
DRAFT Revised January 14, 2004

Land Area	The area in square miles of the stream's watershed
Watershed % Imp	The estimated % imperviousness of the stream's watershed
Biomonitored ?	If the stream has been evaluated for compliance with Aq L standards, the year in which the biomonitoring took place. An "n" indicates the stream has not yet been evaluated.
Class	The stream's water quality classification
AqL Class	For evaluated stream's, the highest class aquatic life standard that the the macroinvertebrate community meets. NA indicates failure to meet even Class C standards. A "?" Indicates stream is not yet evaluated.
DO Viol?/Bact Viol?	Yes or no on whether there has been a documented violation of dissolved oxygen or bacteria standards. A "?" Indicates stream is not yet evaluated.
Urban Effect	Yes or no on whether it is likely that impairment is due to urban stormwater and associated effects. A "?" Indicates stream is not yet evaluated.

Appendix 4. Candidate "Sensitive or Threatened" Locations

This list was compiled based on both projected population and population density using a linear projection of population change from the period 1990 to 2000. Municipalities included on the list have a projected population of at least 5,000 people, or a projected population density of at least 150 people per square mile.

TOWN	COUNTY	LA_SQ_MI	POP2000	POPDENS2000	POP2030	POPDENS2030
Arundel	York	23.9210	3585	150	6308	263.70
Auburn	Androscog.	59.6193	23270	390	19853	333.00
Augusta	Kennebec	55.3150	18607	336	10222	184.80
Bangor	Penobscot	34.3928	31560	918	26321	765.31
Bar Harbor	Hancock	42.3440	4827	114	5945	140.40
Bath	Sagadahoc	9.0864	9292	1023	7643	841.15
Belfast	Waldo	34.0202	6401	188	6467	190.09
Berwick	York	37.4255	6373	170	7418	198.21
Biddeford	York	29.9836	21005	701	21666	722.60
Boothbay	Lincoln	5.7507	2338	407	2289	398.04
Boothbay Harbor	Lincoln	22.1822	2965	134	3891	175.41
Brewer	Penobscot	15.3027	9013	589	8899	581.53
Bridgton	Cumberland	56.5061	4897	87	6645	117.60
Brunswick	Cumberland	46.7402	21234	454	21963	469.90
Bucksport	Hancock	51.4852	4922	96	5174	100.49
Buxton	York	40.5293	7476	184	10339	255.10
Camden	Knox	17.7508	5261	296	5829	328.38
Cape Elizabeth	Cumberland	14.5606	9082	624	9689	665.43
Casco	Cumberland	31.2877	3478	111	4825	154.21
Castine	Hancock	7.8348	1345	172	1898	242.25
China	Kennebec	49.7123	4116	83	5289	106.39
Cumberlandd	Cumberland	26.1432	7179	275	11150	426.50
Damariscotta	Lincoln	12.4217	2044	165	2735	220.18
Dayton	York	17.9408	1813	101	3647	203.28
Durham	Androscogn	38.2230	3390	89	5007	130.99
Eastport	Washington	3.5178	1646	468	674	191.60
Eliot	York	19.7731	5969	302	7846	396.80
Ellsworth	Hancock	79.2494	6472	82	7925	100.00
Fairfield	Somerset	53.6851	6590	123	6136	114.30
Falmouth	Cumberland	29.4306	10344	351	18462	627.31
Farmingdale	Kennebec	11.2798	2813	249	2470	218.98
Farmington	Franklin	55.7141	7424	133	7326	131.49
Freeport	Cumberland	34.7810	7823	225	10486	301.49
Gardiner	Kennebec	15.5686	6215	399	4535	291.29
Glenburn	Penobscot	27.1481	3976	146	6268	230.88
Gorham	Cumberland	50.8313	14176	279	21029	413.70
Gray	Cumberland	43.1673	6839	158	9566	221.60
Greene	Androscog	32.3403	4087	126	5317	164.41
Hallowell	Kennebec	5.8727	2473	421	2266	385.85
Hampden	Penobscot	37.9414	6340	167	7383	194.59
Harpswell	Cumberland	23.9185	5251	220	5937	248.22
Hermon	Penobscot	35.8165	4449	124	6494	181.31
Hollis	York	32.0830	4125	129	5736	178.79

Maine Department of Environmental Protection
DRAFT Revised January 14, 2004

TOWN	COUNTY	LA_SQ_MI	POP2000	POPDENS2000	POP2030	POPDENS2030
Houlton	Aroostook	36.6021	6494	177	6061	165.59
Kennebunk	York	35.5418	10495	295	17895	503.49
Kennebunkport	York	20.5131	3724	182	4810	234.48
Kittery	York	17.5563	9575	545	10047	572.27
Lebanon	York	54.9657	5096	93	7569	137.70
Lewiston	Androscog	34.3676	35792	1041	23446	682.21
Limington	York	42.0453	3411	81	5209	123.89
Lisbon	Androscog	23.2764	9109	391	7921	340.30
Lyman	York	38.8589	3808	98	5021	129.21
Manchester	Kennebec	21.1451	2470	117	3565	168.60
Mechanic Falls	Androscog	11.1670	3147	282	3799	340.20
Monmouth	Kennebec	34.1844	3799	111	5097	149.10
New Gloucester	Cumberland	47.2086	4819	102	7478	158.40
North Berwick	York	37.9781	4303	113	5773	152.01
North Yarmouth	Cumberland	21.4585	3222	150	5562	259.20
Oakland	Kennebec	25.6998	5974	232	7034	273.70
Ogunquit	York	4.0898	1228	300	1983	484.86
Old Orchard Beach	York	7.5335	8877	1178	12048	1599.26
Old Town	Penobscot	39.2313	8147	208	7560	192.70
Orono	Penobscot	18.1197	9126	504	4751	262.20
Orrington	Penobscot	24.7018	3537	143	4192	169.70
Owls Head	Knox	8.4423	1603	190	1675	198.41
Paris	Oxford	40.7979	4805	118	5695	139.59
Poland	Androscog	42.5348	4879	115	6461	151.90
Portland	Cumberland	21.3397	64418	3019	63906	2994.70
Presque Isle	Aroostook	76.5458	9537	125	6399	83.60
Randolph	Kennebec	2.0428	1916	938	1802	882.12
Raymond	Cumberland	33.1357	4311	130	7270	219.40
Rockland	Knox	12.9142	7628	591	6520	504.87
Rockport	Knox	22.1932	3216	145	4283	192.99
Sabattus	Androscog	25.7766	4496	174	6836	265.20
Saco	York	38.4706	16871	439	21782	566.20
Sanford	York	47.5811	20866	439	21816	458.50
Scarborough	Cumberland	47.5006	17020	358	30372	639.40
Sidney	Kennebec	42.1994	3521	83	6262	148.39
Skowhegan	Somerset	58.8613	8846	150	9094	154.50
South Berwick	York	32.1326	6690	208	9036	281.21
South Portland	Cumberland	12.0143	23390	1947	23864	1986.30
South Thomaston	Knox	11.3200	1420	125	1986	175.44
Standish	Cumberland	60.4543	9313	154	14134	233.80
Thomaston	Knox	10.5930	3760	355	5098	481.26
Topsham	Sagadahoc	32.1939	9126	283	10115	314.19
Turner	Androscog	59.6739	4988	84	6982	117.00
Vassalboro	Kennebec	44.2571	4057	92	5160	116.59
Veazie	Penobscot	2.9935	1746	583	2069	691.16
Waldoboro	Lincoln	71.1655	4931	69	5850	82.20
Warren	Knox	46.7335	3804	81	5580	119.40
Waterboro	York	55.5451	6238	112	11353	204.39
Waterville	Kennebec	13.5910	15643	1151	10893	801.49
Wells	York	57.2604	9420	165	14292	249.60
West Bath	Sagadahoc	11.8593	1804	152	2048	172.69

Maine Department of Environmental Protection
DRAFT Revised January 14, 2004

TOWN	COUNTY	LA_SQ_MI	POP2000	POPDENS2000	POP2030	POPDENS2030
West Gardiner	Kennebec	24.6318	2909	118	4015	163.00
Westbrook	Cumberland	17.1837	16188	942	16218	943.80
Windham	Cumberland	46.5190	14949	321	20585	442.51
Winslow	Kennebec	36.8950	7763	210	6984	189.29
Winthrop	Kennebec	31.0740	6249	201	7048	226.81
Wiscasset	Lincoln	24.6494	3610	146	4375	177.49
Yarmouth	Cumberland	13.3155	8375	629	9849	739.66
York	York	54.9671	12881	234	21965	399.60

Appendix 5. Draft Statutory Changes

Sec. 1. 38 MRSA §420-C, second paragraph, is amended to read:

A person who owns property that is subject to erosion because of a human activity before July 1, 1997 involving filling, displacing or exposing soil or other earthen materials shall take measures in accordance with the dates established under this paragraph to prevent unreasonable erosion of soil or sediment into a protected natural resource as defined in section 480-B, subsection 8. Adequate and timely temporary and permanent stabilization measures must be taken and maintained on that site to prevent unreasonable erosion and sedimentation. This paragraph applies on and after July 1, 2005 to property that is located in the watershed of a body of water most at risk as identified in the department's storm water rules effective December 31, 1997 adopted pursuant to section 420-D and that is subject to erosion of soil or sediment into a protected natural resource as defined in section 480-B, subsection 8. This paragraph applies on and after July 1, 2010 to other property that is subject to erosion of soil or sediment into a protected natural resource as defined in section 480-B, subsection 8.

Sec. 2. 38 MRSA §420-D, first paragraph, is amended to read:

§420-D. Storm water management

A person may not construct, or cause to be constructed, a project that includes ~~20,000 square feet or more of impervious area or 5~~ one ~~acres or more of disturbed area in the direct watershed of a body of water most at risk from new development or one acre or more of impervious area or 5 acres or more of disturbed area in any other area~~ without prior approval from the department. A person proposing a project shall apply to the department for a permit using an application provided by the department and may not begin construction until approval is received. This section applies to a project or any portion of a project that is located within an organized area of this State

Sec. 3. 38 MRSA §420-D, section 1, is amended to read:

1. Standards. The department shall adopt rules specifying quantity and quality standards for storm water. Storm water quality standards for projects with 3 acres or less of impervious surface may address phosphorus, nitrates and suspended solids but may not directly address other dissolved or hazardous materials unless infiltration is proposed. ~~Storm water quality standards apply only in the direct watersheds of waterbodies most at risk from development and in sensitive or threatened geographic regions or watersheds defined by the department under subsection 4. Until such regions are defined, storm water quality standards are not required to be met by a permit applicant.~~

Sec. 4. 38 MRSA 420-D(12) is enacted to read:

12. Significant sources. In addition to the approval required for construction pursuant to the first paragraph of this section, the department may require a person owning or operating a significant source to obtain approval from the department. A "significant source" is a source of stormwater pollution from developed area in existence prior to July 1, 1997 and located in the direct watershed of a waterbody that is impaired due to urban runoff.

- A. The department shall develop a total maximum daily load analysis or other appropriate study or plan for the watershed of a waterbody impaired due to urban runoff prior to designating significant sources within the watershed.
- B. The department shall promulgate rules prior to requiring that an owner or operator of a significant source within the direct watershed of a specific waterbody obtain approval. The rules must include the following:
 - (1) The name or other means of identifying the waterbody that is impaired due to urban runoff;
 - (2) A list of significant sources or a description of the types or classes of significant sources that require approval;
 - (3) A date or schedule indicating when approvals must be obtained; and
 - (4) Stormwater quantity and quality standards.
- C. The owner or operator of a site designated as a significant source shall apply to the department for approval.
- D. In addition to the exemptions described in subsection 7, this subsection does not apply to significant sources constructed prior to July 1, 1997 that would not have required approval from the department if constructed on or after July 1, 1997.

Appendix 6. Options for Managing Stormwater

The stakeholder group spent time discussing a number of options for changing the way stormwater is managed in Maine. Most of these options appear in the list of Recommendations (Section E.), at least in part. For those that have not been recommended by the Department, a brief explanation follows the option as to why it was not included.

Regulatory

- Develop stormwater standards that apply equally in all parts of the state where the Stormwater Law applies. This would entail elimination of the “most at risk” and “sensitive or threatened” designations that are currently in the Stormwater Law.

Not included: This approach would result in requirements the Department deems unnecessary in rural parts of the state. While this would help alleviate the concern for sprawl, it would not provide for “meaningful protection” in many instances.

- Apply a base level of standards for all regulated area of the state, but use the existing “most at risk” and “sensitive or threatened” categories to designate the areas where water quality and quantity impacts from new development are of concern, based on both past development and projected future growth. Develop criteria and a list of streams for these categories in keeping with current statutory and rule requirements.
- Develop a permitting threshold in the State’s Stormwater Law that is more consistent with the one-acre disturbance threshold in the Federal NPDES Program. This would simplify the question of when a permit is needed and would allow for eventual integration of the state and federal programs.
- Develop quantity and quality standards in the rule that provide better protection than the current peak flow and TSS standards provide, but that also provide options for applicants, particularly for those located in impaired watersheds where they cannot cause or contribute to a water quality violation.
- Develop a provision for reducing standards in impaired watersheds where a local management plan has been approved by the Department, and is being implemented. Allow implementation to be deferred in municipal designated growth zones until financial assistance is available (for a limited time).
- Develop maintenance requirements that will improve the level of maintenance performed by permittees.

- Seek to regulate smaller developments, including single family homes; could include an exemption if path of stormwater run-off is disconnected; i.e., there is not a continuous channel for run-off to follow from the developed site to a receiving water.

Not included: Single family homes, while high in number, do not tend to be major contributors of stormwater pollutants, other than for erosion and sedimentation during construction for which the Erosion & Sedimentation Control Law already applies (see separate DEP report to 121st Maine Legislature on the Erosion & Sedimentation Control Law, January 2004). The Department concludes that resources would be better spent focusing on stormwater from commercial and industrial development and roads.

- Use the existing Total Maximum Daily Load (TMDL) assessment process to identify significant existing sources of pollutants in impaired watersheds. Regulate those sources using authority of the wastewater discharge law, or seek additional authority under the Stormwater Law.
- Reduce or eliminate standards for certain degraded urban streams; use the Use Attainability Analysis (UAA) process to designate those streams.

Included in part: Clean Water Act does not allow for “writing off” of streams. Conducting a UAA on some impaired streams may be appropriate. However, even for those stream reaches, all practicable steps will be need to be taken first to restore water quality to the extent feasible.

- Include allowance for innovative approaches to meeting stormwater standards in the rule.

Non-Regulatory

- Develop outreach material for the regulated community to improve their understanding of what they need to do to comply with state and federal program requirements.
- Provide municipalities with tools for developing local stormwater management programs. The Maine Stormwater Law already provides for delegation of the program to a municipality if an approved local program exists.
- Seek financial assistance for municipalities or watershed districts seeking to develop and/or implement local management programs.
- Conduct a campaign to build the public’s knowledge base on stormwater issues.

- Develop information for developers and the consulting community on ways to minimize stormwater impacts through the use of Low Impact Development measures.
- Continue to offer training to a variety of audiences (developers, contractors, consultants, municipal officials) on proper erosion and sedimentation controls.